# NOAA Research

## Office of Oceanic and Atmospheric Research

# FY 2000 Operating Plan


Submitted January 5, 2000

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# FY 2000 OPERATING PLAN

## *MISSION:*

***The Office of Oceanic and Atmospheric Research (OAR) conducts environmental research and develops technologies needed to improve NOAA services and enable our Nation to balance a growing economy with effective management of our environment and natural resources. OAR:***

- C ***Studies Earth as a system extending from the surface of the Sun to the floor of the ocean;***
- C ***Improves environmental predictions affecting public safety and quality of life by using better observations, assessments, and models;***
- C ***Creates economic opportunities from the wise use of marine resources; and***
- C ***Provides the scientific basis for sound national and international environmental policy.***

OAR accomplishments planned for FY 2000 are organized into Objectives, Performance Measures (**PM**), and Milestones in support of five of the seven goals contained in the NOAA Strategic Plan:

## 1.0 PROGRAM INFORMATION/PLANNED ACCOMPLISHMENTS

1. Sustain Healthy Coasts
2. Build Sustainable Fisheries
3. Advance Short-Term Warning and Forecast Services
- C Implement Seasonal to Interannual Climate Forecasts
- C Predict and Assess Decadal to Centennial Change

The milestones are taken directly from the most recent Five-Year Implementation Plans. The last page of Section 1 contains two tables showing the number of milestones expected to be accomplished by each of OAR's organizational units, one distributed by Fiscal Year Quarter and the other by Strategic Plan Goal. Abbreviations used throughout this document are as follows:

**OAR Research Laboratories**

Aeronomy Laboratory (AL)
Air Resources Laboratory (ARL)
Atlantic Oceanographic & Meteorological Laboratory (AOML)
Climate Monitoring and Diagnostics Laboratory (CMDL)
Climate Diagnostics Center (CDC)
Environmental Technology Laboratory (ETL)
Forecast Systems Laboratory (FSL)
Geophysical Fluid Dynamics Laboratory (GFDL)
Great Lakes Environmental Research Laboratory (GLERL)
National Severe Storms Laboratory (NSSL)

Pacific Marine Environmental Laboratory (PMEL)
Space Environment Center (SEC)

**Extramural Programs**
Office of Global Programs (OGP) (also funds NOAA programs)
National Sea Grant College Program (SG)
National Undersea Research Program (NURP)
OAR Joint Institutes (JI)

**Interagency Programs**
Office of Research and Technology Applications (ORTA)
National Acid Precipitation Assessment Program (NAPAP)

**International Programs**
Office of International Activities (IA)

# OAR MANAGEMENT MILESTONES:

Q1: Ship and Aircraft needs defined for coming year. (OAR, E. White; ONCO)

Q1: Report on the progress of the conversion of GFDL's major model codes to run on the new scalable supercomputer, to be installed in Q4 FY 2000. (GFDL, B. Ross)

Q2: Provide NOAA with sample authorizing language for the National Undersea Research Program, which the Administration can use for a possible legislative amendment during the current session of Congress. (NURP, E. Myers)

Q3: Perform a review of the future mission of NOAA's Geophysical Fluid Dynamics Laboratory by a external and internal leading scientist. (GFDL, B. Ross)

Q1,3: The NOAA Science Advisory Board will meet at least twice each year for the purpose of advising the Under Secretary of Commerce for Oceans and Atmosphere on long- and short-range strategies for research, education, and application of science to resource management. (SAB, M. Uhart)

Q3: Award contract for GFDL's scalable high-performance supercomputer system. (GFDL, B. Ross)

Q4: "SEC Techniques Challenge" Completed - Selected Numerical Technique(s) Begin Evaluation for Transition to Operations. (SEC, T. Onsager)

Q4: The NOAA Panel on Climate and Global Change will continue to meet three times per year to evaluate and improve the program for scientific quality and for relevance to NOAA's goals and the needs of the scientific community. (OGP, H. Benway)

Q4: Start Phase III - DESIGN for the Norman Consolidation project, allowing NOAA to start lease negotiations with the University of Oklahoma. (NSSL, D. Forsyth)

Q4: Prepare a NOAA-wide strategy paper to define future cooperation with China in marine and fishery science and technology. This document will help NOAA set priorities for cooperation with China over the next five years under the U.S-China Marine and Fishery S&T Protocol and the U.S.-China Forum on Environment and Development. (IA, K. Lamon)

# OAR PROGRAM MILESTONES:

[Dollars shown by Objectives are from FY 2000 President's Request]

## GOAL: SUSTAIN HEALTHY COASTS

### OBJECTIVE 1: Protect, Conserve, and Restore Coastal Habitats and Their Biodiversity

**PM:** *Percent of U.S. coastline [and areas of special national concern] with threats to habitat assessed and ranked (15% in '99)*

Q1: Describe the ecology, threats to and health of coastal ecosystems that are particularly sensitive to global change and anthropogenic impacts, including coral reefs and polar regions. (NURP, E. Myers)

**PM:** *Number of 6 U.S. coastal regions with reduced introductions and impacts of non-indigenous species (1 in FY 2000)*

Q1: Support research and outreach activities which will protect and enhance the health of coastal ecosystems by improving the quality of coastal and Great Lakes waters and promoting understanding of coastal and Great Lakes ecosystems. Prepare a report on actions taken and accomplishments. (Coastal Habitat Enhancement Theme) (SG, L. Cammen & V. Panchang)

Q3: Determine whether the interaction of zebra mussels with nutrient dynamics in mussel-infested areas of the Great Lakes is a significant factor in the development of blue-green algal blooms in those areas. (GLERL, H. Vanderploeg)

Q4: Determine the role of zebra mussels on the decline of the native amphipod Diporeia spp. (GLERL, T. Nalepa)

**PM:** *Percent of U.S. coastline with threats to habitat assessed and ranked (20% in FY 2000)*

Q4: Develop methods to quantify the contribution of atmospheric deposition as a threat to sensitive coastal habitats. (ARL, B. Hicks)

**PM:** *Number of environmental technologies and tools developed that enhance monitoring, assessment, management and restoration of coastal habitats (14 in FY 2000)*

Q2: Develop technologies to collect long-term, continuous ocean observations needed to monitor the health of important coastal ocean habitats. (NURP, E. Myers)

**GOAL: SUSTAIN HEALTHY COASTS**

Q4: Develop technologies and procedures to assist in wide-area, rapid assessment, mapping and description of coastal habitats associated with areas of high coastal development and threatened ecosystems. (NURP, E. Myers)

Q4: Improve technology transfer program in the Great Lakes region to give Great Lakes communities access to enhanced remote sensing data, products, and other tools to improve monitoring, environmental science, and decision-making to enhance water resource protection, management, and public enjoyment. (GLERL, G. Leshkevich)

**OBJECTIVE 2: Promote Clean Coastal Waters to Sustain Living Marine Resources and to Ensure Safe Recreation, Healthy Seafood, and Economic Vitality**

**PM:** *Percent of U.S. coastal regions with assessments of atmospheric pollution effects on water quality and habitat (38% in FY 2000)*

Q3: Establish and maintain integrated research monitoring sites at strategic locations. (ARL, R. Artz)

**PM:** *Number of coastal and Great Lakes states provided with improved predictive capabilities and understanding of environmental processes (3/10 in FY 2000)*

Q1: Develop improved water-level statistics that reflect: (1) existing hydrologic and hydraulic conditions; (2) the long lag response of the lakes to meterological variability; (3) changes in climatic regimes; and (4) the needs of diverse Great Lakes decision-makers. (GLERL, F. Quinn)

Q1: Complete and publish new Lake Ontario high resolution bathymetry. This new, more accurate, and higher resolution digitally-based compilation of the bathymetry of Lake Ontario will have many uses, but in particular, is needed for improved physical models of Lake Ontario, and is especially needed for the Great Lakes Coastal Forecasting System. (GLERL, D. Reid & T. Holcombe)

Q3: Describe the processes that control the distribution and impacts of pollutants and nutrients on sensitive coastal ecosystems. (NURP, E. Myers)

Q2: Support research, development and outreach/implementation of advanced technologies which are critical to the economic health of the coast, enhance environmental monitoring, assessment and remediation of coastal areas and/or enhance understanding of coastal environmental processes. Prepare a report on actions taken and accomplishments. (Ocean and Coastal Technologies Theme) (SG, L. Kupfer & L. Cammen)

Q3: Support research, development and outreach for ports and harbors that will improve planning and operations. Prepare a report on actions taken and accomplishments. (Urban Coast) (SG, V. Panchang & V. Omelczenko)

**PM**: *Develop better tools, predictive models, and understanding related to water quality and coastal ecosystems management.*

Q2: Complete the first field year of the 6-year NOAA-NSF Coastal Ocean Program "The Impact of Episodic Events on the Great Lakes" and report results to NOAA-COP, NSF, and on the web. (GLERL, B. Eadie & D. Schwab)

Q3: Determine the utility of the critical body-residue approach for improving assessment of contaminant impacts for non-persistent high volume commercial products such as selected surfactants, an important component of laundry detergents. (GLERL, P. Landrum)

Q4: Develop new perspectives on the wind waves generation and growth processes. (GLERL, P. Liu)

**OBJECTIVE 3: Foster Well-planned and Revitalized Coastal Communities That Are Compatible with the Natural Environment, Minimize the Risk from Natural Hazards, and Provide Access to Coastal Resources for the Public's Use and Enjoyment**

**PM:** *Cumulative percent of shoreline and inland areas with improved ability to identify extent and severity of coastal hazards (35% in FY 2000)*

Q3: Conduct coastal hazards research addressing: severe storms, earthquakes and tsunamis, coastal planning and building construction and shoreline processes and erosion. Provide outreach through coastal hazard specialists and education by establishing information clearinghouses. Prepare a report on actions taken and accomplishments. (Coastal Hazards) (SG, V. Panchang & J. Murray)

**PM:** *Number of improved information management tools developed to assist coastal hazard mitigation (4 in FY 2000)*

Q4: Develop improved understanding of and techniques for predicting coastal hazards. (NURP, E. Myers)

Q4: Produce tsunami inundation maps for threatened coastal communities in Alaska, Washington, Oregon, and California. (PMEL, E. Bernard)

**GOAL: SUSTAIN HEALTHY COASTS**

**PM:** *Number of activities conducted to provide a technically trained work force and environmentally informed citizenry (24 in FY 2000)*

Q3: Conduct outreach/educational activities for students and citizenry so that they better understand the oceans and their role and impacts on human welfare. (NURP, E. Myers)

Q1: Through both formal and informal educational mechanisms, improve public understanding of marine and coastal issues, increase the number of resource managers/policy makers knowledgeable about marine and coastal issues, and educate and support students needed to sustain the field of marine and coastal science. Prepare a report on actions taken and accomplishments. (Education and Human Resources Theme) (SG, S. Walker & S. Fiske)

**PM:** *Number of models for new commercial products and industrial processes based in bio-products from marine organisms (8 in FY 2000)*

Q4: Investigate new products from the sea using state-of-the-art exploration and biotechnology techniques. (NURP, E. Myers)

Q4: Recover, isolate, and conduct culturing experiments with microorganisms from deep-sea vent systems. (PMEL, S. Hammond)

## GOAL: BUILD SUSTAINABLE FISHERIES

### OBJECTIVE 1: Eliminate & Prevent Overfishing and Overcapitalization

**PM:** *By 2004, 50% fewer overfished fisheries (86 of 269 stocks now subject to overfishing)*

Q2: Provide improved stock assessments for species that are not accessible to towed sampling gear. (NURP, E. Myers)

Q4: Continue support of a broad range of fishery projects that contribute to the national marine fisheries service and OAR strategic plans and objectives. Sea Grant will support research to address reduction of commercial by-catch, rebuilding fisheries that have declined, influence of physical factors on fisheries, modeling and prediction of fishery stocks, and development of better assessment methods to determine the status of fishery stocks. Prepare a report on actions taken and accomplishments. (Fisheries Theme) (SG, E. Anderson & J. McVey)

**PM:** *Improve technology for modeling and predicting survival of larvae and juveniles, and recruitment*

**GOAL: BUILD SUSTAINABLE FISHERIES**

Q3: Complete International Program on "Experimental Surveys for the Assessment of Juveniles (JUVESU) to Assess Juvenile Anchovy and Sardine in the Eastern Atlantic. (ETL, J. Churnside)

Q3: Develop and improve methods for gathering and using information relating to fisheries management. (PMEL P. Stabeno)

Q4: Develop and deploy a bio-physical mooring in the North Pacific Ocean to assess the oceanographic and atmospheric impacts of long-term climate and oceanographic variability on commercially important fish stocks. (PMEL, P. Stabeno)

**PM:** *By 2004, 60% of stocks have "essential fish habitat"*

Q1: Define Essential Fish Habitat, e.g., physiography and how the fish use the habitat, for at least four species of declining fisheries. (NURP, E. Myers)

Q2: Assess the effectiveness of Marine Protected Areas (MPAs) for sustaining and enhancing fisheries and EFH. (NURP, E. Myers)

Q3: Define the impacts of fishing and other anthropogenic activities on EFH. (NURP, E. Myers)

**PM:** *Seafood Science & Technology theme*

Q4: Support research and outreach and develop technologies and techniques that will decrease costs, ensure high-quality and safe products and improve waste management for seafood. Prepare a report on actions taken and accomplishments. (SG, J. Murray & L. Kupfer)

**OBJECTIVE 2: Attain Economic Sustainability in Fishing Communities**

**PM:** *By 2004, 10% increase in employment in non-capture fishing and/or other sectors*

Q3: In partnership with other private and public sector entities, conduct research focused on at least two marine communities whose economies are impacted by traditional capture fisheries in order to identify key processes and mechanisms underpinning the dynamics of these marine communities and to identify opportunities for economic development and diversification. (Coastal Communities & Economies Theme) (SG, F. Schuler & J. Eigen)

**OBJECTIVE 3: Develop Sound Aquaculture**

**PM:** *By 2004, 20% increase in economic contribution of aquaculture to present aquaculture value of GDP*

Q2: Make investments through a competitive process that contributes to the Build Sustainable Fisheries initiative and DOC aquaculture policy goals pertaining to us aquaculture. Objectives of the investments will be to develop new technologies to create new, and expand existing, aquaculture industries in offshore, recirculation and more traditional production systems. Prepare a report on projects funded relative to improvement of culture systems, genetics, nutrition, disease diagnosis and control and biotechnology leading to an expanded aquaculture sector. Prepare a report on actions taken and accomplishments. (SG, J. McVey & E. Anderson)

# GOAL: ADVANCE SHORT-TERM WARNING & FORECAST SERVICES

## OBJECTIVE 3: Enhance Observations & Prediction

**Geomagnetic Storm Warnings**
(customers = power, communications, navigation, satellite operation)

**PM:** *Improve geomagnetic storm predictions*

Q1: ACE Tracking Ground Station in India fills in wintertime morning data gap increasing real-time solar wind data coverage and reliability. (SEC, R. Zwickl)

Q3: Acquisition of IMAGE data enables advanced research leading to advanced ionospheric and magnetospheric predictive capabilities. (SEC, T. Onsager)

**Ionospheric Storm Warnings**
(customers = communications, navigation)

**PM:** *Improve ionospheric storm predictions*

Q3: Incorporation of NOAA Continuously Operating Reference Sites (CORS) Total Electron Content (TEC) data into the SEC/NSWP observation suite allows for enhanced validation of developing models of ionospheric disturbances and increases the return on the NOAA CORS network investment. (SEC, T. Fuller-Rowell)

## U.S. Weather Research Program

**PM:** *Hurricanes at Landfall*

Q2: Assess 1999 operational performance of the new coupled atmosphere-ocean GFDL Hurricane Prediction System. (GFDL, R. Tuleya)

Q2: Incorporate new observations such as cloud-drift winds, scatterometer winds, and GPS dropsonde profiles into the real-time hurricane surface wind analysis scheme. Provide near-real-time web access. (AOML, M. D. Powell)

Q3: Document the effect of GPS dropsondes on hurricane track forecasts through data denial simulations based upon the multi-aircraft hurricane synoptic flow missions flown during the 1997 through 1999 seasons. (AOML, S. D. Aberson)

**PM:** *Quantitative Precipitation Forecasting*

Q3: Via a USWRP Grant, complete the development of a technique that integrates multiple WSR-88Ds, satellite, rain gauge and environmental information to robustly quantitatively estimate precipitation. (NSSL, K. Howard)

Q4: Complete the enhancement of the R&D WSR-88D to include dual-polarization capability and evaluate the ability to quantitatively estimate precipitation amounts and to perform in-cloud hydrometer mapping. (NSSL, D. Zrnic)

## North American Observing System Program and the U.S. Weather Research Program

**PM:** *Data Assimilation and Optimal Mix of Observations for Improved Precipitation Forecasting*

Q3: Complete winter tests of Hypothesis 2, relating to the potential improvement of North American forecasts through the use of selected GOES imager and sounder data. (Hypothesis 2 has been adopted by the North American Observing System Council and will attempt, through observing system simulations, to determine whether or not forecast improvements result from assimilating certain types of satellite data into operational numerical weather prediction models at the National Center for Environmental Prediction.) (FSL, T. Schlatter)

**GOAL: ADVANCE SHORT-TERM WARNING & FORECAST SERVICES**

## Technique and Technology Research and Development

**PM:** *All Weather Forecast PM's*

Q3: Complete Under-Flight Simulations of the Space-Based Advanced Microwave Sounding Radiometer (AMSR) with All AMSR Frequencies. (ETL, A. Gasiewski)

Q3: Provide Remote Sensing for Aircraft Icing Avoidance Summary and Recommendations from Analysis of Data from the Mount Washington Icing Sensors Experiment (MWISP). (ETL, R. Reinking)

Q4: Develop a Buoy-based Wind Profiler System. (ETL, J. Jordan)

## Technology Infusion

**PM:** *All Weather Forecast PM's*

Q2: Deliver Open Radar Product Generator (ORPG) to the Tri-agency WSR-88D Operational Support Facility (OSF) and work with them to begin fielding throughout the network. (NSSL, M. Jain)

Q3: Implement Warning Decision Support System (WDSS) technology into AWIPS / System for Convection Analysis and Nowcasting (SCAN). (NSSL, J.T. Johnson)

Q4: Deploy an Infrasonic Tornado Detection Demonstration Network. (ETL, A. Bedard)

Q4: Test and, as appropriate, implement new verification scheme for Storm Prediction Center outlook forecasts with practical upper and lower bounds on skill. (NSSL, H. Brooks)

Q4: Develop and demonstrate advanced WFO workstation concepts that implement visualization of data in three dimensions and improved workstation architectures using LINUX and Java technologies. (FSL, H.Grote & D. Walts)

## National Tsunami Hazard Mitigation Program

PM: *Improve Tsunami Forecasts*

Q4: Deploy a network of prototype real-time, deep-ocean, tsunami detection moorings. (PMEL, E. Bernard)

## GOAL: IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS

### OBJECTIVE 1: Implement Prediction Systems

**PM:** *The following are relevant for operational S-I forecasts:*

*Increases in skill and/or lead time of ENSO forecasts (SST correlations vs. lead time)*
*Increases in skill and/or lead time of U.S. wintertime seasonal temperature forecasts*
*Increases in skill and/or lead time of U.S. wintertime seasonal rainfall forecasts*
*Increases in skill and/or lead time of tropical rainfall forecasts.*

*[Notes: The last PM is new. Current skill measure is the Heidke skill score, and NWS suggests that this be retained; however new skill measures will likely be introduced for probabilistic weather and climate forecasts (probably the Brier Skill score).]*

**PM:** *Expand the range and usefulness of climate services by implementing new climate forecast products, e.g., drought forecasts, heat wave forecasts, etc., and subsequently improving the skill of these forecasts*

Q3: Next-generation of water resources prediction will be augmented through publication of a book, "Probabilistic Meteorology Outlooks in Operational Hydrology." The book describes both theoretical developments and practical methodology for using probabilistic meteorological outlooks to make probabilistic hydrology outlooks. (GLERL, T. Croley)

Q4: Report on CDC research on experimental climate monitoring and forecasts contributing to the development of an integrated suite of NOAA forecast products. (CDC, J. Whitaker)

Q4: Assess the seasonal predictability of world-wide temperature and precipitation within various atmospheric general circulation models used by the International Research Institute, and the sensitivity of seasonal-to-interannual climate predictability to ENSO and non-ENSO forcings, including decadal trends. (CDC, M. Hoerling)

### OBJECTIVE 2: Maintain and Improve Observing and Data Delivery Systems

**PM:** *Respond to customer demand by increasing the number of operational and research data sets updated, developed, produced and delivered.*

NESDIS Metrics:
*Amount of data delivered online (terabytes)*
*Customer demand measured by Internet & off-line data & information requests (millions)*
*Number of operational data sets updated, developed or produced*

**GOAL: IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS**

*Percent of Satellite Active Archive (SAA) operational*
*Data set additions to SAA*

Q3: Maintain and upgrade data sets: GHCN, COADS, CARDS, SSM/I rain and snow, radiation, and clouds, USHCN, ocean profiles, ocean buoys, ocean currents, paleo-climate database, global relief database. (NESDIS, T. Karl, OGP, B. Murray)

Q3: Report 1999 observations of precipitation and deep cloud systems in the tropical Pacific that will help characterize the vertical structure of precipitating systems, which aids satellite calibration and development of improved models. (AL, C. Williams)

Q4: Provide on-line access of historical observations from Pacific profilers to enhance the data resources available for study of seasonal-to-interannual variability of tropical wind fields. (AL, D. Carter)

Q4: Complete updating the digital Great Lakes ice cover data set. This data will advance the understanding of the impact of climate variability. (GLERL, R. Assel)

**PM:** *[proposed new measure for OAR] Increase the cumulative number of ocean observations that are critical for improving seasonal-to-interannual climate analyses and forecasts. (Metrics: Numbers of observations (of given types) globally and by major subregions critical for improving S-I analyses and forecasts, e.g., tropical Pacific, tropical Atlantic, Indian Ocean, extratropical Pacific, etc.)*

Q1: Demonstrate the use of dual-wavelength radar profilers to unambiguously identify raindrops and turbulence in profiler meteorological observations to extent profiler observations and data sets beyond just winds. (AL, K. Gage)

Q2: Demonstrate a Ship-borne Wind Profiler for Continuous Monitoring of Winds Over the Ocean. (ETL, D. Law & M. Post)

Q2: Implement sustained observations for EPIC (Eastern Pacific Investigations of Climate). (OGP, M. Patterson)

Q3: Ensure official support from of Japan on the implementation of ARGO under the U.S.-Japan Common Agenda. (IA, U. Joshi)

## OBJECTIVE 3: Conduct Research for Improved Climate Predictions

**PM:** *Improve understanding of atmospheric, oceanic, land surface and cryospheric processes that contribute to seasonal-to-interannual climate variability, as measured by peer-reviewed publications from NOAA-supported research programs.*

**GOAL: IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS**

Q2: Complete GCIP research and enhanced observing activities in the LSA-East Central region. (OGP, R. Lawford)

Q4: Complete the plan for GAPP (GEWEX Americas Prediction Project), a GCIP follow-on project. (OGP, R. Lawford)

Q4: Parameterization of Heat and Moisture Flux at the Top of the Boundary Layer Using Combined Remote Sensors. (ETL, B. Stankov)

Q4: Complete analysis of the spectral characteristics of the GPS atmospheric vapor signals to understand and predict the statistical behavior of the moisture field at particular sites. (ETL, D. Wolfe & R. Lataitis)

**PM:** *Improve NOAA model capabilities to simulate seasonal-to-interannual climate variability by decreasing errors in sea-surface temperatures, sea level pressure, wind and precipitation fields (metrics: reductions in root-mean-square errors, increases in anomaly correlations over standard periods, e.g., 1979-98 or test cases, relative to "baseline" model skill)*

Q2: Evaluate GFDL's major effort to produce a consolidated atmospheric modeling system, including its new approach to couple to ocean, land, and ice sub-models in support of a very wide range of applications. (GFDL, I. Held & J. Anderson)

Q3: The impact of climate change on water resources will be evaluated through a regional coupled model prediction of Great Lakes water resources under greenhouse warming. (GLERL, B. Lofgren)

Q3: Analyze progress of the longer-term GFDL effort to produce a comprehensive coupled atmosphere-ocean-land surface seasonal-interannual prediction system. (GFDL, J. Anderson)

Q3: Describe the physical processes whereby strong Madden-Julian oscillations during northern winter contributed to the onset of the 1997-98 El Nino, and identify whether the intensity of Madden-Julian oscillations during northern winter may be predictable from knowledge of the west Pacific sea surface temperature anomalies during the previous northern fall. (CDC, K. Weickmann)

**OBJECTIVE 4: Deliver Climate Services and Assess Socio-Economic Impacts**

**PM:** *Increase user satisfaction with NOAA's seasonal-to-interannual forecast products, as documented through workshops and annual user surveys*

**GOAL: IMPLEMENT SEASONAL TO INTERANNUAL CLIMATE FORECASTS**

Q1: Create a web site that provides simple access to a wide range of climate products and services offered by the NOAA Climate Diagnostics Center and other institutions, including university partners. Initial topics will include: Climatologies; Historic Climate Relationships; Climate Forecasts; ENSO Forecasts; Current Conditions; Drought/Flood Monitoring; and Data Sources. (CDC, D. Mock and Smith)

Q3: Development and implementation of activities to advance demonstrated utility of climate forecasts to decision makers in climate sensitive sectors. (OGP, C. Nierenberg; NWS)

Q4: Report on regional assessment activities on the impacts and usability of climate and weather information for water and resources management in the western United States. (CDC, H. Diaz)

**PM:** *Assess the socio-economic impacts of seasonal-to-interannual climate variability by completing analyses of regional or sector-based uses of climate information (metric: number of reports completed on regional or sector-based analyses)*

Q2: Launch the Pan American Climate Information System with the US Agency for International Development. (OGP, L. Farrow)

Q3: Issue the report of findings of the ENSO Experiment (field work conducted in FY 1998 & 1999) to document and analyze the effects of the ENSO warm event on the emergence and spread of disease. (OGP, J. Trtanj)

Q4: Compile and synthesize a compendium of lessons learned in the field of applications research over the past decade. (OGP, C. Clark)

## GOAL: DOCUMENT, PREDICT, AND ASSESS DECADAL-TO-CENTENNIAL CHANGE

### OBJECTIVE 1. Characterize the Forcing Agents of Climate Change

**P.M.:** *Results of 90% of the research activities are to be cited in the year-2001 IPCC Third Assessment of Climate Change*

**Subject:** *Global Monitoring, Process Studies, and Modeling Associated with Greenhouse Gases*

Q4: Report on $CO_2$ Gas Flux Measurements Over the Ocean. (ETL, J. Hare)

**GOAL: DOCUMENT, PREDICT, AND ASSESS DECADAL-TO-CENTENNIAL CHANGE**

Q4: Characterize the role of lightning-produced chemical species in the absorption of radiation by clouds providing insight into the current radiative imbalance in climate observations and calculations. (AL, S. Solomon)

**Subject:** *Monitoring, Process Studies, and Modeling Associated with Climate Related Aerosols*

Q3: Report the major findings from the 1997 ACE II field campaign that characterized the aerosol radiative forcing over the North Atlantic. (PMEL, T. Bates; OGP, J. Levy)

Q3: Report on the major scientific findings associated with the 1998 WB-57 aircraft studies of the chemistry of aerosols and meteorological tracer species that help characterize the chemical and radiative processes in the difficult-to-assess region near the tropopause. (AL, A. Tuck)

**OBJECTIVE 2: Understand the Role of the Oceans in Global Change**

**PM:** *Results of 90% of the research activities are to be cited in the year-2001 IPCC Third Assessment of Climate Change*

**Subject:** *Improvement of Coupled Climate Prediction Models*

Q3: Evaluate the progress of GFDL's long-term effort to produce more accurate global and regional projections of long-term climate change in support of the IPCC and U.S. climate assessments. (GFDL, R. Stouffer)

Q3: Report on mechanisms of natural variability of climate on interannual-to-decadal time scales. (GFDL, T. Delworth)

**Subject:** *Track Climatically Important Oceanic Variability*

Q2: Deploy chemical sensors aboard the NOAA Ship Ka'imimoana along equatorial Pacific cruise track-lines in the region of the TAO Array. (PMEL, R. Feely)

Q4: Complete study in North Atlantic aimed at both determining the air-sea $CO_2$ flux with new techniques and parameterizing the gas transfer velocity. (OGP, L. Dilling)

**Subject:** *Technology for Physical and Chemical Ocean Observations*

Q3: Deploy hydrophone arrays in selected regions not covered by SOSUS. (PMEL, S. Hammond)

## OBJECTIVE 3: Ensure a Long-Term Climate Record

**PM:** *Results of 90% of the research activities are to be cited in the year-2001 IPCC Third Assessment of Climate Change*

**Subject:** *Reconstruction of Past Climates*

Q2: Put in place a fully functioning international paleo-environmental data system (World Data Center for Paleo-climate) to serve as the global data coordination, access and archive point for the international research community. The World Data Center will include easy-access links to specialized national, regional and project databases. (OGP, H. Benway)

**Subject:** *Document Climate Variability Through Instrumental and Paleo-Climatic Records*

Q3: Provide tree-ring reconstructions from sparsely sampled areas of the North Pacific region to the climate dynamics community. These chronologies will provide a record of decadal to centennial-scale variability extending back hundreds to thousands of years that will be useful in studying important elements (i.e., atmosphere-ocean interactions) of the North Pacific climate system, such as the Pacific Decadal Oscillation (PDO). (OGP, H. Benway)

## OBJECTIVE 4: Guide the Rehabilitation of the Ozone Layer

**PM:** *Results of 90% of the research activities are to be cited in the 2002 UNEP/WMO Assessments of Ozone Layer Depletion*

**Subject:** *Monitoring the Atmospheric Trends in Ozone-Depleting Substances and Their Substitutes*

Q1: Publish historical trends of halocarbons from polar firn (compacted snow) filling in the data gap from ice cores to atmospheric measurements. (CMDL, J. Butler)

Q3: Publish the trends of atmospheric nitrous oxide, important for both climate change and ozone depletion. (CMDL, J. Elkins)

**Subject:** *Predicting, Detecting, and Characterizing the Recovery of the Ozone Layer*

Q2: Carry out an airborne field study to characterize the chemical processes involved in ozone destruction in high latitudes of the Northern Hemisphere where large ozone losses have been observed in 6 of the last 9 winters. (AL, D. Fahey)

**GOAL: DOCUMENT, PREDICT, AND ASSESS DECADAL-TO-CENTENNIAL CHANGE**

## Objective 5: Provide the Scientific Basis for Improved Air Quality

**PM:** *Results of 90% of the research activities are to be cited in the 2002 NARSTO Assessment of Fine-Particulate Matter*

**Subject:** *Characterize Rural Ozone Episodes*

Q1: Report on the laboratory studies of the chemical interactions of soot and the nitrogen oxides, which are emitted together by fossil fuel combustion. The report will elucidate processes that must be better quantified if forthcoming nitrogen oxide control strategies are to be soundly scientifically based. (AL, A.R. Ravishankara)

Q3: Carry out the scientific workshop following the 1999 Nashville/Atlanta air quality field study to develop scientific understanding of ozone production from power plant plumes and the chemical composition of health-relevant urban fine particles. (AL, J. Meagher)

Q4: Conduct a ground-based and airborne field study in Texas that characterizes the unique Gulf-inflow, hydrocarbon-refinery, and urban-area air quality processes of the region, which lacks the scientific understanding to underpin emerging needs of regional decision makers. (AL, M. Trainer)

**Subject:** *Early Detection of Improved Air Quality*

Q2: Complete a reassessment of the impact of the emissions controls mandated by the Clean Air Act Amendments of 1990. (ARL, B. Hicks & T. Meyers)

## OBJECTIVE 6: Furnish Prediction, Assessment, & Human-Impacts Information

**PM:** *90% of the Principal Investigators are to be involved in the relevant portions of the IPCC Third Assessment of Climate Change, UNEP/WMO Assessment of Ozone Depletion, and NARSTO Assessment of Surface Level Ozone*

**Subject:** *IPCC Assessments of Climate Change for the U.N. Framework Convention*

Q3: Provide leadership and other facilitation in the Scientific Summary of the year-2000 state-of-science assessment of climate change by the Intergovernmental Panel on Climate Change. (AL, D. Albritton)

# CHART on Program Milestones

(NB: Milestones w 2+ performers are listed under all their performers.)

| Organization | Q1 | Q2 | Q3 | Q4 | Total |
|---|---|---|---|---|---|
| OGP | 1 | 3 | 5 | 3 | 12 |
| SG | 2 | 2 | 3 | 2 | 9 |
| NURP | 2 | 3 | 3 | 3 | 11 |
| IA | - | - | 1 | - | 1 |
| AL | 1 | 2 | 3 | 4 | 10 |
| AOML | - | 1 | 1 | - | 2 |
| ARL | - | 1 | 1 | 1 | 3 |
| CDC | 1 | - | 1 | 3 | 5 |
| CMDL | 1 | - | 1 | - | 2 |
| ETL | - | 1 | 3 | 5 | 9 |
| FSL | - | - | 1 | 1 | 2 |
| GLERL | 2 | 1 | 4 | 4 | 11 |
| GFDL | - | 2 | 3 | - | 5 |
| NSSL | - | 1 | 2 | 2 | 5 |
| PMEL | - | 1 | 3 | 4 | 8 |
| SEC | 1 | - | 2 | - | 3 |
| **TOTALS** | 10 | 19 | 37 | 32 | 98 |

| Organization | BSF | SHC | ASTFW | SIC | DCC | OTHER | TOTAL |
|---|---|---|---|---|---|---|---|
| OGP | - | - | - | 8 | 4 | - | 12 |
| Sea Grant | 4 | 5 | - | - | - | - | 9 |
| NURP | 4 | 7 | - | - | - | - | 11 |
| IA | - | - | - | 1 | - | - | 1 |
| AL | - | - | - | 3 | 7 | - | 10 |
| AOML | - | - | 2 | - | - | - | 2 |
| ARL | - | 2 | - | - | 1 | - | 3 |
| CDC | - | - | - | 5 | - | - | 5 |
| CMDL | - | - | - | - | 2 | - | 2 |
| ETL | 1 | - | 4 | 3 | 1 | - | 9 |
| FSL | - | - | 2 | - | - | - | 2 |
| GLERL | - | 8 | - | 3 | - | - | 11 |
| GFDL | - | - | 1 | 2 | 2 | - | 5 |
| NSSL | - | - | 5 | - | - | - | 5 |
| PMEL | 2 | 2 | 1 | - | 3 | - | 8 |
| SEC | - | - | 3 | - | - | - | 3 |
| **TOTALS** | 11 | 24 | 18 | 25 | 20 | | 98 |

## 2.0 BUDGET/RESOURCE INFORMATION

| | |
|---|---|
| FY 2000 Appropriation: | $297.616M |
| FY 1999 Appropriation: | $287.410M |
| FY 2000 Base: | $281.883M |
| Increase over FY 1999 | $10.206M |
| Increase over Base | $15.733M |

**NOAA Appropriation Bill**

The FY 2000 Appropriations bill for Commerce, Justice, State and Related Agencies was part of the final budget settlement signed by the President on November 29. It incorporated the increases in our Conference bill but with a 0.38% across-the-board decrease which NOAA is taking against every line item and program except for a few high visibility Presidential initiatives (e.g., GLOBE) which were exempted and Congressional add-on's, which were reduced by 7.56%. More detailed information is presented below.

**Highlights**

What OAR received from our Requested Increases:

| | Appropriated | Requested |
|---|---|---|
| ARGO Floats | $1.992 million | $4.000 million |
| Forecast Systems Lab Computer | $0.747 million | $1.500 million |
| GFDL Computer (PAC Account) | $4.981 million | $5.700 million |
| Variability Beyond ENSO | $0.996 million | $3.600 million |
| Climate Forcing Agents | $0.996 million | $3.100 million |
| GLOBE | $0.500 million | $2.500 million |
| USWRP - Hurricanes at Landfall | $0.996 million | $1.500 million |
| Mariculture | $1.992 million | $3.600 million |
| Boulder Rent | $3.835 million | $3.850 million |
| Adjustments to Base | $0.323 million | $1.298 million |
| TOTAL: | $17.358 million | $30.648 million |

**Requests for which we got no funding:**

| | | |
|---|---|---|
| Health of the Atmosphere | -- | $0.387 million |
| Role of the Oceans in Climate | -- | $1.600 million |
| Atmospheric Influence on Aquatic habitats | -- | $1.000 million |
| Baseline Deficiencies Restoration | -- | $1.200 million |
| GEOSTORMS (PAC Account) | -- | $4.340 million |
| NISA/Aquatic Nuisance Species | -- | $0.200 million |
| Hypoxia | -- | $0.400 million |
| Fisheries Oceanography | -- | $0.400 million |
| Sea Floor Observatories | -- | $3.100 million |
| TOTAL: | -- | $8.320 million |

**Transfers:**
GLERL - not transferred to NOS as requested in the President's Budget. The funding level remains unchanged.

In FY 1999, Jason Foundation support was included as a part of the National Undersea Research program. The FY 2000 Appropriations bill transferred the program to NOS. The amount was increased from $1.750M to $2.0 M.

**Add-ons, Earmarks, & Unrequested Enhancements** (described below)

| | | |
|---|---|---|
| Climate Change Research Center | $1.849 million | -- |
| IRI - Refinement of Climate Models | $1.849 million | -- |
| Incorporate Wind Profile Data in Forecast Models | $1.387 million | -- |
| STORM at the U. of Northern Iowa | $1.849 million | -- |
| Radiophysics Lab at Dartmouth | $0.924 million | -- |
| NISA Ballast Water Studies | $0.786 million | -- |
| Tsunami Hazard Mitigation | $2.126 million | -- |
| Arctic Research (restoration to '99 level) | $0.349 million | -- |
| Lake Champlain Study | $0.139 million | -- |
| Canaan Valley Institute (Aquatic Ecosystems) | $3.698 million | -- |
| Gulf of Maine Council | $0.462 million | -- |
| Open Ocean Aquaculture | $2.219 million | -- |
| Pacific Tropical Ornamental Fish | $0.231 million | -- |
| Gulf of Mexico Oyster Initiative | $0.924 million | -- |
| Sea Grant Base ($1.206M over '99) | $6.206 million | -- |
| NURP Base($0.948M > '99 post transfer of Jason to NOS) | $4.748 million | -- |
| TOTAL: | $29.746 million | -- |

## 2.1 PROPOSED/REPROGRAMMING/OTHER FUNDING ISSUES

There is a funding shortfall in the FY 2000 related to the Boulder facility operation/rent. This issue is discussed in detail in section 3.0

## 2.2 ADD-ONS/NEW STARTS/TERMINATIONS

The following is OAR's implementation plan for new starts and add-ons as identified in the FY 2000 Appropriation. (Note: where amount shown for an item is preceded by a "+," the full amount shown is new money. Remaining items received at least some FY 1999 funding.)

**DESCRIPTIONS OF ADD-ONS/EARMARKS:**
(except for Arctic, Sea Grant, & NURP base enhancements)

**Climate Change Research Center ($2.0M)** - Climate and air quality monitoring and research, as well as meteorological and climatological modeling. This will be done through a cooperative agreement as per last year. In FY 1999 funding was split between a grant to the University of New Hampshire Institute for the Study of Earth, Oceans, and Space and funding for NOAA to do identified work. It is not yet determined for FY 2000. [First funded in FY 1999 appropriation, never included in the President's budget.]

**IRI/Refining Climate Models (+$2.0M)** - Continuing efforts to accelerate the refinement of climate models at the IRI. [First appeared in FY 2000 Senate Report. This unrequested program increase in climate modeling is consistent with the mission of the Climate and Global Change Program.]

**Incorporation of wind-profile data into operational forecast models ($1.0M)** - A feasibility study that incorporates wind profile data into operational forecast models and technical development to determine whether the accuracy of weather forecasts are improved. This will be done through grants. [First funded at $1.5 million in FY 1999; never in President's budget request.]

**STORM (U. of Iowa) (+$2.0M)** - This will be mainly a teacher-training/education program. Science Center for Teaching, Outreach, and Research on Meteorology at the University of Northern Iowa will do the work. Details TBD. [First mentioned in FY 1999 Senate Report but not funded until now. Never included in President's budget request.]

**Radiophysics Laboratory at Dartmouth College (+$1.0M)** - According to the Senate Report, a study of radio propagation physics and technology development associated with satellite-based telecommunications, navigation, and remote sensing at the Radiophysics Laboratory at Dartmouth College. Assessment of technology limitations imposed by the space plasma environment and transitionospheric propagation of radio innovations to enhance satellite-based systems. Analysis of the influence of natural or man made disturbed environments on performance and reliability of critical space based systems, and archival of key historical geophysical databases facing degraded long term data integrity. [First appeared in FY 2000 Senate Report. Never in President's budget request.]

**NISA/Ballast Water Studies ($0.85M)** - Ballast Water Technology Development Research, and small-boat-portage zebra-mussel dispersion problems in the Chesapeake Bay and Great Lakes, including Lake Champlain. This shall be done through the RFP process. Senate language has identified Great Lakes (including Lake Champlain) or Chesapeake Bay areas as recipients. [First included in OAR appropriation in FY 1998. Funding targeted specifically for ballast water studies has not been included in the President's budget request. It could be funded under the National Invasive Species Act (NISA) program request.]

**Tsunami Hazard Mitigation Program ($2.3M)** - Continuing Tsunami mitigation planning and research. Efforts will be coordinated between the agencies and states involved in the program. [FY 1995 appropriations allocated $50,000 for the development of an action plan for this multi-agency, multi-state program. Recent appropriations have provided $2.3 million per year.

Although not yet included in the President's budget request, it is an established program at NOAA's Pacific Marine Environmental Laboratory.]

**Lake Champlain Study ($0.15M)** - Studies of atmospheric transport of material into Lake Champlain and of water and sediment transport processes within the lake. Grants and in-house research by NOAA labs. Details TBD. Leahy's office already concerned that next year's program will be terminated if Sea Grant doesn't fund it instead. [Included as a part of appropriations since FY 1992 Although funded by the past several appropriations, it has not yet been included in President's budget request.]

**Aquatic Ecosystem-Canaan Valley ($4.0M)** - Develop and implement locally supported solutions to threats to the sustainability of the environment at the Canaan Valley Institute, Davis, West Virginia. Non-competitive grants, split between construction and program operation. [Construction funds began in FY 1998. Never in President's budget request.]

**Gulf of Maine Council ($0.5M)** - Provide support for the Gulf of Maine Council's efforts to focus state and local resources on programs to improve marine resources in the Gulf of Maine, including newsletter and web page development, the organization and support of a volunteer monitoring program, and the management of a small grants program. [First funded at $0.5 million in FY 1999; never in President's budget request.]

**Open Ocean Aquaculture ($2.4M)** - Open ocean aquaculture feasibility studies, including engineering, biological, environmental, economic and marketing studies. While appropriations have identified UNH, program funds have been competitively distributed throughout the New England Region. [First appeared at $300,000 in FY 1997 reprogramming. Included in FY 1998-1999 appropriations at $1.7 and $2.4 million, respectively. Never included in President's budget request. It is compatible with the President's budget request for mariculture at $3.6 million which will be managed on a regional basis and jointly managed by NMFS and OAR. (Note that UNH operation of this earmark includes this broader focus.)]

**Pacific Tropical Ornamental Fish to be administered by HIEDA (+$0.25M)** - For aquaculture to prevent plundering of aquarium fish from coral reefs as well as the damage to the reefs that occurs when this is done. To be administered by HIEDA (don't yet know what this is). [First appeared in FY 2000 Senate Report. Never in President's budget request.]

**Gulf of Mexico Oyster Initiative ($1.0M)** - Continuation of funding at the FY 1999 level, although authorized for up to $3,000,000 for FY 2000 under the Sea Grant authorization. This will be done through competitive grants. [Identified in FY 1998 appropriation. Never in President's budget request.]

## 2.3 EXTRAMURAL BUDGETS

OAR provides support to universities in the form of grants, contracts, and cooperative agreements for research, outreach support, technology transfer, educational development, and participation in intramural research by university scientists working in OAR laboratories. OAR's university support is provided through several programs ($M).

| Mechanism | FY 1998 Actual | FY 1999 Actual | FY 2000 Estimate~ |
|---|---|---|---|
| SG | $52.4 | $54.0 | TBD |
| OGP | 16.8 | 17.7 | TBD |
| NURP | 13.6 | 12.9 | TBD |
| JIs et al.* | 20.2 | 20.3 | TBD |
| ORTA (OAR SBIR)^ | 1.4 | 1.6 | TBD |
| UNOLS (Ships) | 2.9 | 2.4 | TBD |

* Numbers are based on JI fiscal year, which begins July 1. FY 2000 still undetermined.

^ Effective in FY 1998, ORTA will be issuing contracts in place of the current grants. Only some SBIR awards are to university scientists. FY 2000 levels won't be known until after completion of FY 2001 NSF R&D Survey.

~ FY 2000 estimates will be developed in the course of responding to the annual NSF Survey of Federal Research and Development.

OAR entered into a cooperative agreement with Woods Hole Oceanographic Institute on August 8, 1998, to establish a Cooperative Institute for Climate and Ocean Research (CICOR).

The balance between external and internal research sponsored by OGP will depend on the advice of peer review panels convened in November-December to advise the Program Managers on the quality and relevance of proposed projects. However, it is the goal of the Climate and Global Change Program to maintain a balance of approximately 50% external and 50% internal work.

## 2.4 FINANCIAL AUDIT ACTIONS

In November of 1997, 0AR management initiated an internal review of certain OAR financial management areas. The review was in support of a NOAA-wide effort to implement the recommendations made by KPMG Peat Marwick during its annual audit of NOAA's financial statement. This review had two key objectives: (1) to assess the material areas identified in the KPMG audit report to determine OAR's level of compliance with the report's benchmarks and (2) to provide information on which OAR financial management decisions can be based.

A review team, consisting of staff members from OAR and ERL Headquarters was selected to review five areas: (1) reimbursable agreements (2) personal property, (3) object classification codes, (4) accounts payable, and (5) travel vouchers. Because of the time and

resource constraints, the team designed the review with an eye toward providing a snapshot of the quality of the current financial management practices within OAR rather than a compendium of information relating to the financial areas covered by the KPMG audit. The team conducted on-site testing at several labs and program offices. After several months of reviews, the team submitted it's final report to OAR's Assistant Administrator. Subsequently, copies of the reports were distributed to OAR staff.

In November of 1998, the team met to discuss the appropriate timing for the next set of internal reviews. Because of time and resource constraints, the team decided every two years would be sufficient. Thus, the next set of internal reviews will be conducted during FY 2000. In addition, OAR will include a review of bank card practices among other significant financial issues in these reviews, partly as a result of the recent OIG report on OAR management practices.

OAR has taken the following actions to support NOAA in its effort to achieve and maintain an unqualified audit:

- OAR's financial staff attend the annual NOAA Audit Conference held in Landsdowne, VA, and provide conference notes and the audit report to OAR senior management.

- In FY 1999, OAR appointed a representative to serve on OAR's Grants Management Advisory Council, who reports to report back to the staff pertinent issues and action items specifically related to Audit, i.e. delinquent reports, delayed and slow grants processing time. OAR staff is required, as part of the OAR Quarterly review, to report on the number of grants awarded each month, the date the grant went to NOAA Grants Management Office, the date it's awarded and the numbers of days it took for the award to be processed. OAR must also give a status report on delinquent reports on what steps they are taking to reconcile. In FY 1999 OAR has been aggressive in resolving the issues surrounding delinquent grant reports.

- NOAA implemented its methodology for distributing NOAA-wide overhead costs based on actual costs incurred not including budgeted overhead cost allocations. OAR financial staff participated in several workshops before methodology was implemented and more recently and training/workshop session that was extremely valuable. We are in the process of revising FMC and Line Office distribution rates as a result of the training and OAR's reorganization. This will make closeout for FY 2000 more accurate.

- In additional to the overhead training, OAR financial staff attended training classes provided by OFA on Financial Operating Plans (FOPs) and Financial management Information and Accounting (FIMA).

- OAR Headquarters is sponsoring its first OAR-wide Budget Conference in January 2000 that will provide training and workshops to its financial management centers on pertinent financial issues, e.g., overheads, distribution rates, NOAA and OAR corporate costs, etc. We will also be addressing issues that are pertinent to the KPMG Audit and OIG Report,

e.g., interagency agreements, NOAA's new overhead methodology, and IG concerns about bank cards.

C OAR provides the NOAA Budget Execution staff with a reimbursable tracking table that reports available funds, prior year, accrued cots, undelivered orders and carryover for each reimbursable task. This report also lists sponsoring agency and type of funds (2 yr., 3 yr., no yr.). In addition, each analyst has a checklist of requirements that must be completed before submitting a reimbursable task plan.

C OAR is in the first stages of developing a new management information system (MIS) for use by all of OAR. This system will allow OAR program managers and financial staff to monitor their programs more effectively and prepare more timely analyses of program areas. Also, in FY 2000, OAR is consolidating its "cuff" financial systems into one process, developed by our Pacific Marine Environmental Laboratory that will allow us to monitor more closely our finances. We expect the new financial system to be in place across OAR by October 1, 2000.

C OAR regularly participates in the DOC Management Control Review (MCR) process. This past year, OAR reviewed resource management and property management at PMEL. This year, OAR will conduct a similar review at ETL, during which review of personal property tracking will be a key area for examination.

## 3.0 MANAGEMENT ISSUES

• **Boulder Rent Shortfall ($1,500K)**. The NOAA Boulder complex currently is being billed by GSA using GSA's Proposal "C," with which NOAA cannot concur since it would result in devastating outyear increases in rent charges. This proposal begins with a reasonable return-on-investment (ROI) charge of 6% simple interest on the building shell; however, over the 30-year life of the rental agreement, that rate would gradually ramp up to 16%, which clearly would be unacceptable and would result in the constant need to go back to Congress to request additional funds to cover the Boulder rent cost so as to avoid programmatic cuts. Absent favorable negotiations with GSA and Congress over the rental agreement, NOAA/Boulder will request this year that GSA instead use their Proposal "B," which would have a constant amortized ROI of 8% over the 30-year lifetime of the agreement (NOAA/Boulder has already requested that GSA switch to "Proposal B," but GSA prefers not to make any interim changes until all negotiations are completed.

Even with the currently very favorable ROI of 6%, the NOAA Boulder complex will incur a $601K shortfall during FY 2000. The derivation of this shortfall is as follows:

Costs

| | |
|---|---|
| 6% ROI charges on the building shell under GSA Proposal "C" | $2,440K |
| Expected charge when GSA back-bills us for switching to 8% (Proposal "B") [1] | 1,141K |
| 7.35% Tenant Improvement (TI) loan repayment | 1,245K |
| GSA General & Administrative (G&A) costs (at $2.50/gross square foot) | 930K |
| GSA Services (at $2.50/gross square foot) | 930K |

| | |
|---|---|
| GSA Security costs (at $0.44/gross square foot) | 164K |
| Utilities, PSC loan, & NIST security & site charges [2] | 2,539K |
| Other Building Expenditures [3] | 497K |
| Total rent & associated costs | $9,886K |

Funds Available

| | |
|---|---|
| Funds available from previous rent budget (after 0.38% rescission) | $4,346K |
| New funds appropriated in FY 2000 (after 0.38% rescission) | 3,835K |
| Total funds available | $8,181K |

Shortfalls

| | |
|---|---|
| Worst case scenario (current charges continue plus reversion to Proposal "B") | $1,705K |
| Best case scenario (GSA rolls over on all areas of negotiation) | $979K |
| Realistic scenario (NOAA wins a few concessions from GSA) | **$1,500K** |

_____

1. Since the Boulder complex will shift to GSA Proposal "B" during this current year, GSA is expected to back-bill NOAA/Boulder for an annual 8% amortized ROI on the building shell (barring any unexpected mandate from Congress to GSA to pursue a fairer course of action). This would result in a total ROI charge of $3,581K for FY 2000 instead of the $2,440K currently being charged under GSA Proposal "C," whose unacceptability is explained above. The three areas of negotiation with GSA and their potential savings involve changing to: a 6.25% ROI ($576K), the national GSA TI rate of 6.3% ($57K), and the national GSA G&A rate of $2.25/occupiable square foot ($93K). To date, GSA has taken a very hard line; thus, we realistically do not expect much beyond a few minor concessions from GSA.

2. The specific costs for this line are:

| | |
|---|---|
| Utilities | $920K |
| PSC Loan | 90K |
| NIST/DOC Security | 614K |
| NIST Site Charges | 915K |
| Total | $2,359K |

3. These costs include:

| | |
|---|---|
| O&M of fiber-optic network in new building | $477K |
| Hazardous waste disposal & permits | 20K |
| Total, "Other Building Expenditures" | $497K |

## 3.1 FTE PLANS

OAR's FY 1999 Target of 955.5 included 13 FTE from the FY 1999 pass back, 10 new hires associated with the FY 1999 appropriation, and 11.5 FTE for participation in the Student Education Employment Program. All these increases were approved by the DOC. In addition, OGP was transferred to OAR on March 31, 1999. More recently, the Science Advisory Board staff were transferred from NOAA's Chief Scientist Office to OAR

Headquarters (May 23, 1999). Funding and FTE were expected to be permanently transferred to OAR October 1, 1999. OAR's revised target for FY 2000 will be 958.5 FTE.

OAR is required to submit an FTE Table as part of its input for the NOAA Quarterly Review. This table includes the Target, FTE usage through the quarter, projected usage through the end of the year as well as a detailed report on expected vacancies, retirements, hires, etc. It also includes a report on non-Federal employees, e.g., contractors and joint institute employees.

## 3.2 ORGANIZATIONAL ISSUES

**Restructuring of the Office of Oceanic and Atmospheric Research** - A restructuring of OAR was effective October 1, 1999. Some key features of this change include:

- Elimination of the ERL management layer. The laboratories now report directly to the OAR Assistant Administrator and Deputy Assistant Administrator.
- Programmatic direction/guidance is now provided by three "theme-based" OAR Associate Directors who focus on oceanic resources, atmospheric, and climate themes.
- Establishment of a Senior Research Council to guide development of OAR's science agenda. This council facilitates sharing scientific and technical guidance across OAR.

**Development of a Management Information System** - OAR is seeking to develop a management information system (MIS) by October 1, 2000. This program began in a response to an IG report in September of 1998 which recommended the development of such a system. The OAR MIS working group has developed a project plan, identified and selected a financial commitment system, documented business rules, and selected a contractor to lead the requirements development process.

**Role of Science Advisory Board in OAR Science Reviews** - Earlier this year, discussions with members of NOAA's Science Advisory Board (SAB) included a proposed role for the SAB in NOAA's science reviews.. Under a NOAA-wide pilot project, the OGP panel has been reconstituted as a SAB working group. Currently, OAR is working with the SAB to develop a working group related to the OAR laboratories and joint institutes. A proposal for this effort will be presented to the SAB at their April 2000 meeting.

**Sea Grant Management Improvements.** Sea Grant made significant changes in its operations and procedures to implement recommendations made in the 1994 National Research Council report, *A Review of NOAA National Sea Grant Program.* Among the changes were: a simplified and decentralized management structure; an increase in participation by our partners in the decision-making and planning processes; and an implementation of a rigorous process of planning, solicitation, and peer review of research projects.

Sea Grant introduced a performance-based program evaluation protocol for individual Sea Grant programs that will be tied to a competitive, merit-based resource allocation. Both past performance and future direction will be considered. Program Assessment Teams of high-level academicians and managers focus on program accomplishments relative to written

scientific and management objectives contained in program implementation plans. Seven to eight programs are to be evaluated each year, and the highest-rated programs will receive budget increases based on their performance. In FY 1998, the first eight Sea Grant programs were evaluated (MIT, USC, HI, CA, MN, RI, NC, and MS/AL). In July of 1999, the National Sea Grant Office issued a report summarizing the outcome of the first year of performance-based program evaluation: *National Sea Grant College Program Performance Evaluation: A Report to the Under Secretary.* In FY 1999, seven additional programs were reviewed (IL/IN, TX, NJ, SC, WA, VA, and MI). In FY 2000, an additional seven programs are scheduled for evaluation (FL, GA, MD, NY, OH, OR, and WHOI). These evaluations will be reported on by OAR during the NOAA 4th Quarter Review.

**National Undersea Research Center Reviews** - The reinvention of NURP, which began in 1997, was based upon a number of policy changes within the program. Key among them was the principle that the program was to carry out research relevant to NOAA and national needs. The NURP headquarters office is responsible for specifying these needs in the guidelines within which the centers must work. The six undersea research centers were given the responsibility for managing and directing their programs to produce the desired research with the understanding that they would be periodically evaluated to determine their success in meeting these needs and their efficiency in managing their programs. The review schedule for the centers has been established, and the first two program evaluations will be undertaken this year with the Caribbean Marine Research Center scheduled for February and the West Coast and Polar Regions Center for later in the year.

## 3.3 DIVERSITY

In FY 2000, OAR will fully participate in NOAA's Diversity Program activities and will aggressively strengthen its own internal Diversity Program efforts. As part of its reorganization, OAR established a headquarters Diversity Program Manager position who will expand diversity efforts OAR-wide.

OAR also has established a OAR Diversity Council to focus on quality-of-work-life issues within OAR as well as to support the NOAA Diversity Council and the NOAA Diversity Program Plan. OAR's Deputy Assistant Administrator will chair the OAR Diversity Council as well as serve on the NOAA Diversity Council. The OAR Council will develop both annual and multi-year plans and will develop a OAR Diversity Web Page.

Program activities will concentrate on external and internal initiatives under the guidance of the OAR Diversity Council. External initiatives will include OAR Outreach Committee activities directed to local communities at all OAR locations.

Internal activities will focus on incorporating Diversity program elements into the OAR workforce environment. OAR will implement the activities related to the NOAA Survey, Feedback, and Action Program (SFA). Specifically, workgroups across OAR will continue to develop action plans and implement resolutions of issues identified in the workgroups and to elevate issues that cannot be resolved at the workgroup level.

The OAR Diversity Program Plan will focus on the ten SFA issues that OAR employees believe most critical. To accomplish this, the established SFA workgroups will continue discussing the identified quality-of-work-life issues throughout the year. The OAR Diversity Council will work on the ten issues identified by the SFA as the areas needing restructuring and/or redefining.

In addition to the above, OAR intends to sponsor one of the monthly NOAA diversity education seminars in Silver Spring and participate in the Change Agent training. Performance plans for all OAR supervisors and managers have been modified to include specific language addressing diversity activities. Special joint diversity and EEO studies will be conducted to improve management's understanding of employee concerns. A planning committee from both councils will begin designing a joint conference to be held in Boulder in FY 2001.

## 3.4 AFFIRMATIVE ACTION

In FY 2000, OAR will continue its various affirmative action initiatives already in place and expand to additional areas that offer potential for increased representation in the workplace. As part of OAR's reorganization and the elevation of the EEO Office to the OAR Assistant Administrator level, OAR intends to expand its EEO oversight activities by documenting vacancy recruitment and selections for all of the OAR operating units and program offices. This will also include documenting quarterly progress in hires, promotions, separations, training, resources devoted to EEO, and awards. An EEO element in performance plans will be included for all OAR supervisors and managers. Monitoring of post doc placements will be included as part of the targeted recruitment efforts to address under representation of minorities, women, and the disabled.

OAR will focus on recruiting future employees through targeted efforts using the Post Doc program for science positions and the PHASE and SCEP programs for undergraduate student positions. OAR will be carefully reviewing the recruitment and selection process of these two programs to ensure achievement of affirmative action goals. OAR will make quarterly assessments of under-represented groups by occupation/career path, including the identification of organizational components with severe under representation and the development of targeted recruitment plans.

Other major activities include working with community organizations to expand opportunities to place students by conducting outreach to community organizations and minority serving institutions and collaborating in joint projects with HBCUs, MSIs, tribal colleges, and community organizations. The EEO Office will continue outreach efforts to community organizations, such as the American Indian Science and Engineering Society (AISES); the Mathematics, Engineering, Science Achievement (MESA) program; and the Society for the Advancement of Chicanos and Native Americans in Science (SACNAS). OAR will expand its efforts to ensure inclusion of all under represented groups. Outreach efforts into the local community by various OAR laboratories and programs will be documented on their quarterly reports. The EEO Committee will be fully restructured to become the OAR EEO Council and, along with the OAR Diversity Council, will mirror the structure and activities of the

NOAA EEO Council and Diversity Councils. Each council will develop a yearly work plan and continue to develop individual laboratory and program office web pages. Special joint EEO and diversity studies will be conducted to improve management's understanding of employee concerns. A planning committee from both councils will begin designing a joint conference in Boulder for FY 2001.

## 3.5 EMPLOYEE DEVELOPMENT & TRAINING

| | |
|---|---|
| OAR Salary/Benefits..... | $75,321,000 |
| OAR Training and Development..... | $1,209,035 |
| Percent of Total..... | 1.60% |

(NOTE: The above figures are projections based on the FY 2000 figures assuming a FY 2000 salary increase. OAR's total salary/benefits will be approximately $75,321,000. The above figures include the Office of Global Programs as a part of OAR.)

OAR's Employee Development and Training includes a wide range of training and developmental opportunities, such as courses in management, budget, computer, scientific fields, and other subjects, all intended to broaden, develop, and sharpen employee skills and performance. Professional staff development is also provided via participation in major domestic/international seminars sponsored by such organizations as the AMS. In addition, OAR offers opportunities for ADP technical training, individual employee nighttime university educational classes, and individual employee 2-3 day employee development training classes during working hours. In FY 2000, several OAR employees will participate in OPM's development training programs. Moreover, the Office of Global Programs plans an Retreat to foster communications and teamwork, while OAR Headquarters is planning a Budget/Administrative Conference bringing together its field and headquarters support staffs in developmental training sessions. Finally, OAR also provides opportunities for rotational assignments to Sea Grant Colleges and NOAA Headquarters staffs.

### POSTDOCTORAL RESEARCH ASSOCIATE PROGRAM

(Note: This section is not included in the totals above, but part of the overall employee development is the Post-Doctoral Research Program. OAR has removed the program from the totals because the program's candidates are not NOAA employees.)

The National Research Council (NRC) administers the NOAA Postdoctoral Research Associate Program through a contract. NOAA has been part of the program since 1970, when OAR/ERL first entered the program. OAR is one of 30 Federal agencies who participate.

The program provides research opportunities for postdoctoral scientists of unusual promise and ability to work on problems that are compatible with the interests of NOAA. Participating laboratories receive a stimulus to their programs by the presence of highly educated, recent doctoral graduates and senior investigators with established records of research productivity.

Several NOAA line offices participate in the program. As a result, NOAA has over 310 Research Advisers in 42 participating laboratories and centers in 26 different geographic locations. Programmatic funds available for "base-funded" slots are $816,000 for OAR and an additional $162,000 for the National Marine Fisheries Service (NMFS). In addition, individual laboratories and centers are estimated to add additional funds of approximately $1,300,000.

## 3.6 ENVIRONMENTAL COMPLIANCE

### VISION

All hazardous materials and wastes located at Office of Oceanic and Atmospheric Research (OAR) facilities will be properly identified, handled, and disposed of in accordance with a reasonable interpretation of the complex body of NOAA, State, and Federal regulations and laws (at least a dozen applicable Federal acts). As an integral part of our mission, OAR accepts responsibility for environmental and natural resource stewardship for present and future generations. In conducting research to improve and protect the environment and to better predict environmental change, OAR will not harm the environment.

### OAR ENVIRONMENTAL COMPLIANCE (EC) STRUCTURE

The Director of each OAR laboratory or program facility is responsible for ensuring that program activities are routinely conducted in an environmentally compliant manner and that required funding for doing so is requested. The Director is responsible for: knowing which, if any, hazardous materials are used, stored, or disposed of by the facility; identifying in a timely fashion any environmental deficiencies that may occur; and reporting such problems concurrently to the appropriate NOAA Regional Environmental Compliance Officer (RECO) and to the Deputy Assistant Administrator (DAA) of OAR.

Those laboratory or program directors whose staff deal with hazardous materials must work closely, either directly or through a specified staff person, with the RECOs, who provide technical advice, identify training requirements, arrange for requested training and environmental audits, complete the OMB A-106 process, identify deficiencies, and develop preliminary cost estimates for actions to be taken.

At OAR Headquarters (HQ), responsibility for environmental compliance is delegated to the DAA. To assist the DAA, a designated OAR EC coordinator works with laboratory/program contacts and the RECOs to: (1) coordinate the development and updating of an OAR EC strategic plan, (2) obtain adequate documentation for quarterly environmental compliance reporting to NOAA HQ, and (3) take steps to ensure that all OAR staff using, storing, or disposing of environmentally hazardous materials are identified, are adequately trained, and report requisite information about environmental compliance. This information is then tailored for OAR’s formal reporting requirement to NOAA.

**PERFORMANCE MEASURES AND MILESTONES**

**GOAL I:** OAR will keep abreast of the extent to which its many parts are subject to potential environmental problems and will work to ensure that its employees comply with EC laws and regulations.

**Objective A:** OAR will identify those OAR laboratories and other program facilities at which employees handle, store, or dispose of hazardous materials.

1. Each laboratory/office will compile a list of all employees with a significant direct involvement with hazardous materials and the supervisors in their chain of command. ("Significant direct involvement" is comprised of 10% or more of one's time & responsibilities for the use, storage, & disposal of such materials.)
2. Each laboratory/office will report annually to OAR HQ the names of employees & supervisors who are so involved (i.e., update the list). (3rd Qtr.)

**Objective B:** OAR will ensure that such employees and their supervisors recognize that adherence to environmental laws and regulations are expected parts of their job performance.

1. Each laboratory/office will ensure that specific EC elements or references have been entered into the performance plans of the employees and supervisors identified in I.A.1. (3rd Qtr. - for inclusion in FY 2000 mid-term performance plan updates.)

**GOAL II:** OAR will ensure that its employees have an adequate awareness of EC requirements and receive training sufficient to fulfill their responsibilities.

**Objective A:** OAR will ensure that employees who may, in some capacity, become involved with hazardous materials attain a sufficient awareness of the types of EC mandated by various laws and regulations.

1. A copy of the NOAA Environmental Awareness Video has been distributed to each OAR laboratory/facility with ten or more employees. Each such laboratory/facility will verify that employees with any hazardous materials involvement have had an opportunity to view the video and that it is part of the orientation for all such new employees. (Ongoing)

**Objective B:** OAR will ensure adequate EC training is received by employees who use, store, or dispose of hazardous materials.

1. Each OAR laboratory/facility with such employees will arrange for appropriate training with assistance from its Regional Environmental Compliance Officer (RECO). (Ongoing)
2. Each OAR laboratory/facility and individual employees will retain training records. (Ongoing)
3. Each laboratory/office will report annually to OAR Headquarters what percentage of those identified in I.A.1 are currently up to date in receipt of appropriate training and will be so by the end of the fiscal year. (4th Qtr.)

**GOAL III:** OAR will establish & maintain formal HQ EC Oversight.

**Objective A:** OAR will establish & maintain an **EC Steering Group** with assistance and advice from the NOAA EC Office.

1. The Group will consist of OAR's DAA, Executive Officer, Executive Director/Boulder Laboratories, and EC Coordinator.
2. The Group will meet at least once in the second quarter to develop & track EC program plans for the current and out-year budget years and once in the fourth quarter to assess the health of OAR's EC program and to make recommendations to the AA. ($2^{nd}$Qtr., $4^{th}$Qtr.)
3. The Group will maintain an up-to-date list of "designated responsible officials" at each OAR laboratory/program who serve as the point of contact with OAR HQ. (Ongoing)
4. The Group will review the following reports from OAR laboratory/program directors, their designated points of contact, or NOAA officials & make recommendations to the AA:
   a. EC References in Performance Plan (Objective I.B.1)
   b. Awareness & Training Efforts (Objectives II.B.3)
   c. Audit Reports & Corrective Action Plans

**GOAL IV:** OAR will report periodically to NOAA on its EC status via the NOAA Quarterly Reviews.

**Objective A:** OAR will complete and present to NOAA a Program Compliance Assessment based upon the Facility Compliance Assessments completed by the RECOs. (Each Qtr.)

**Objective B:** OAR will work with the NOAA EC Staff and the RECOS to complete all possible corrective actions in response to EC audit recommendations made for the OAR Laboratories. ($1^{st}$ Qtr.)

## 4.0 OTHER INFORMATION

## 4.1 LEGISLATIVE ISSUES

Our primary legislative concerns for FY 2000 are support for the President's **FY 2001 budget request** and **authorizing language** impacting NOAA programs. There was some interest late in the current legislative session in authorizing language for NURP; we will pursue that, most likely through a NOAA authorization bill. If the Administration or Congress is ready to propose an aquaculture bill, we will have a strong interest in that as well.

A final authorization issue relates to the **Cooperative Institutes**. We are working with the Department's Office of General Counsel on a new Grants and Cooperative Agreements Manual in order to clarify where competition enters the process and to avoid the need for additional legislation. The Joint and Cooperative Institute Programs are expected to fall under a new category of "Institutional Awards" to ensure that our discretionary programs are consistent with Departmental policy, responsive to NOAA needs, and awarded on the basis of merit. Institutional Awards establish long-term partnerships between NOAA and the recipient to foster an effective scientific relationship that is mutually beneficial and furthers NOAA's

Strategic Plan and programmatic goals. NOAA will conduct internal program reviews prior to noncompetitive renewals to confirm satisfactory performance. In the event that a recipient is performing in an unsatisfactory manner, that recipient will be given the opportunity to correct any deficiencies. If NOAA determines that the Institution is unable to reach an acceptable level of performance, the institution will be replaced by another selected through full and open competition.

In addition, we have serious concerns about the **proliferation of Congressional add-ons** in our budget. The concern relates in large part to the time and expense of the management and award process. The issue is exacerbated by the Commerce General Counsel's insistence on sole-source justifications as well as restrictions on our spending a small amount of these funds for the administration of these grants.

Finally, we will continue efforts to gain Congressional support for NOAA research programs through cooperative **staff briefings**, site visits, and projects with our university partners. When the FY 2000 President's Budget was sent to the Hill, OAR scientists did over 60 staff briefings and participated in site visits in Boulder, New York, and Princeton during the February-to-April time period. We hope to see use the fall recess to continue to build better understanding of our research programs, particularly in the House of Representatives.

## 4.2 MINORITY SERVING INSTITUTIONS

The OAR Deputy Assistant Administrator was asked by the NOAA Administrator to chair the NOAA Minority Serving Institutions Council. The mission of the Council is to work towards strengthening educational opportunities and participation of the Historically Black Colleges and Universities (HBCU), Hispanic Serving Institutions (HSI), and Tribal Colleges and Universities (TCU) communities in the areas of oceanic, atmospheric, and environmental sciences (AOES). The council members are NOAA's Deputy Assistant Administrators as well as the directors of OFA, Human Resources Management Office, Office of Civil Rights; the deputy director of the Office of NOAA Corps Operations, and a representative of the Office of the Administrator.

The NOAA MSI Council will focus on including all minority serving institutions in NOAA's efforts to build capacity for minority educational opportunities in the AOES by providing full opportunities and participation using an open and competitive process for funding. The Council's mission will help ensure a diverse NOAA workforce in the 21st century.

Accomplishments of the NOAA MSI Council will be reported each quarter by OAR in the NOAA Quarterly Reviews.

## 4.3 VALIDATION FOR GPRA

The purpose of the Government Performance and Results Act (GPRA) (Public Law 103-62) is to provide for the establishment of strategic planning and performance measurement in the Federal government. In accordance with GPRA's purpose, OAR will validate and verify its performance measurement activities in its FY 2000 Operating Plan in the following ways:

**NOAA Quarterly Reviews**: The Operating Plan lists milestones and performance measures for the fiscal year. Through written and oral reports delivered at the Quarterly Reviews, NOAA will verify that OAR's milestones and performance measures have been achieved.

**External Program Reviews**: The science of several OAR programs will be validated through external program reviews by panels of experts drawn from such sources as the National Academy of Sciences and the National Research Council, through peer review of proposals, and through the publication of articles in refereed journals. Programs will be reviewed at national and international scientific conferences. In addition, some OAR programs (e.g., Climate and Global Change [C&GC]) will be evaluated through independent review by the NOAA Panel on Climate and Global Change (PCGC). This independent review panel includes scientists as well as stakeholders or users (e.g., from the International Panel on Climate Change and the United Nations Environmental Program). Success and deficiencies in quality, approach, and methodology will be addressed by the Panel.

**Peer Review of Proposed Research**: In addition to evaluation of past performance, peer review of the scientific quality of proposed research will be conducted as follows:

- The plans for the main program elements of the NOAA Climate and Global Change (C&GC) program will be reviewed by the NOAA PCGC. Based on the evaluation of the plans for needs of users and research program priorities, funding levels of the program elements will be adjusted if necessary.

- Research proposals which respond to the C&GC Announcement of Opportunity typically will be sent to five peer reviewers for evaluation by mail and then evaluated and competitively ranked by a convened panel of three to five other peers prior to funding decisions.

**Field Experiments**: OAR scientists conduct field experiments to meet the organization's mission and objectives. OAR will rely on reports immediately following these field experiments and on formal publications, usually with a lag time of a year or more.

**New Equipment & Systems**: New technological capabilities are crucial to effective scientific experiments. OAR will rely on reports that new equipment and systems have been put into place, indicating the initial benefits experienced.

**New Analytic Techniques**: OAR will rely on written descriptions of results of newly implemented techniques.

**Laboratory and Modeling Experiments**: OAR will rely on written confirmation of laboratory experimental and modeling results.

**Validation of Forecasts**: Validation includes retaining the entire data set of forecasts made, generating accuracies, skill scores, and statistics and reporting these to the public routinely.

**New Observational Sensors**: OAR will rely on written confirmation of sensor installation and initial results.

**Scientific Assessments & State-of-the-Science Reports**: OAR will rely on actual physical delivery of such reports and the substantive reception they receive.

**New Observational Sites and Centers**: OAR will rely on written confirmation of their opening or start-up and on initial benefits.

**Demonstrations**: OAR will rely on analytic reports on completed demonstrations and their anticipated beneficial impacts.

## 4.4 CUSTOMER SERVICE PLANS

Each of OAR's principal research programs: 12 research laboratories, Sea Grant and NURP, have developed Customer Service Plans in fulfillment of requirements under Executive Order 12862 and the National Performance Review. Each entity has identified its customers in five major categories (internal NOAA; other governmental; non-governmental, nonprofit; non-governmental for-profit; and general public) and has listed ways in which is communicates to each of these classes of customers and how it facilitates feedback from its customers.

Areas of focus for **OAR External Affairs:**

- Implement newsletter to enhance internal OAR communications
- Identify and formalize ways to work with Sea Grant Extension Service to enhance and extend outreach activities for OAR
- Redesign web page to make it more useful, lively and engaging to the general public and other classes of NOAA Research customers

Areas of focus for FY 2000 Customer Service identified by individual OAR research entities:

**Aeronomy Laboratory**

- Complete the first state-of-understanding scientific assessment of air quality.
- Take a leadership role in the Climate Services Initiative in partnership with DOC, with emphasis on learning from private-sector CEOs their needs for climate-related technical and economic information.
- With our Joint Institute CIRES, formulate a Boulder-based education specialist task.

**Air Resources Laboratory**

- Improve forecasting in response to emergencies
- Continue development of air quality and regulatory models
- Develop ozone forecasting model
- Improve the understanding of the atmospheric parameters by continuing to measure/monitor fluxes of $CO_2$ and other gases

**Atlantic Oceanographic and Meteorological Laboratory**

- Focus on fostering feedback from non-governmental, for profit customers. There are companies that fit in this category who use our products, but they do not always contact us directly for information; to encourage feedback, it may be useful to incorporate a 2 to 3 question survey at the bottom of our web page (i.e Did you find the information you were searching for, Will you visit our site again in the future (bookmark?)

**Climate Diagnostics Center**

- Enhance CDC Web Site with items of interest to the broad climate science community and to the general public, including pages that will serve as an easy reference to on-line climate information and services. The page will contain a short description of the service or information resource and a thumbnail graphical example of the product. The information and services will be grouped by topic, such as a section on Climate Forecasts and on Drought/Flood Monitoring. Much of the development of these pages will be done in consultation and collaboration with our constituent groups. A primary emphasis will be to support regional climate assessments associated with OGP's Western Water Initiative.
- Formalize a regular set of meetings with our Western Water constituents, comprising water managers, agricultural interests, and forestry officials. CDC plans to initiate spring and fall workshops to better communicate with these groups on a regular basis and to solicit their feedback in a timely manner. In some cases these meetings will need to be supplemented with field visits to understand how climate products can be tailored to better meet the constituents' needs.
- Develop educational materials to display in the hallway next to the CDC map room. These displays will tell the story of how CDC research is used to: (1) improve long-range forecasts and (2) better understand the impacts of climate variability, especially as these relate to the El Nino/Southern Oscillation phenomenon. The displays will be utilized by individual visitors, tour groups, and open-house events.

**Climate Monitoring and Diagnostics Laboratory**

- Develop the NOAA/CMDL global air sampling network and development of the United States sites to measure greenhouse gases in the vertical profile. The information obtained from these activities are crucial to climate modelers and, ultimately, policy makers.
- Increase CMDL participation in the VOGNET program created by Steve Ryan at the Mauna Loa Observatory. This program involves Hawaiian schools in research of volcanic pollutants.

**Environmental Technology Laboratory**

- Expand CRADA to include other instruments
- Continue summer hire program of science students
- Explore further interactions with NCAR
- Develop better ties/communication with NESDIS through NAOS, the TROIKA

**Forecast Systems Laboratory**

- Continue to monitor new technology advances for AWIPS application, in order to maintain the system's efficiency and cost-effectiveness.
- Continue research on the Scalable Modeling System, which enhances the ability to run weather models in parallel architectures and provides source code portability between a large subset of existing massively parallel processors.
- Continue heavy involvement in the North American Observing System (NAOS) program, with the goal of designing an improved composite observing system for the next century.

**Geophysical Fluid Dynamics Laboratory**

- Complete biannual survey of GFDL scientists on collaborations, to identify customers and GFDL products that customers use

**Great Lakes Environmental Research Laboratory**

- Expand and strengthen linkages with Great Lakes Sea Grant Network outreach and extension to encourage wider access to GLERL products, services, and expertise
- Seek out and utilize input from Sea Grant outreach and extension to identify emerging resources issues of concern to constituents and to meet such needs in our products, services, and expertise offered
- Promote internal interactions with other NOAA line office components regionally and nationally

**National Severe Storms Laboratory**

- Implement customer feedback surveys for several customer classes
- Troika meetings
- NOAA constituent briefings

**Pacific Marine Environmental Laboratory**

- Continue to work with FEMA/USGS/and the states of Alaska, California, Hawaii, Oregon, and Washington on all three parts of the program: hazard assessment, warning guidance, and mitigation.

**Space Environment Center**

- Compile detailed list of requests for changes/additions to services at annual Space Weather Week
- Log and consider customer requests throughout the year
- Hold special vendor meetings at Space Weather Week to focus on vendor needs
- Work with NOAA Public Affairs and Outreach Team and other labs to satisfy needs and requests of public
- Improve our web site for all users, particularly the public

**National Sea Grant College Program**

- Theme teams will be responsible for developing products that will enhance the method by which the entire Sea Grant network operates. The theme areas, which organize the Sea Grant network's activities under common areas of interest, are: Aquaculture, Coastal Hazards, Coastal Communities and Economics, Education and Human Resources, Fisheries, Ecosystems and Habitats, Ocean and Coastal Technologies, Urban Coast and Seafood Science and Safety.
- Through research and outreach, assist NMFS in implementing Essential Fish Habitat provisions, the new fishery management approaches that have been Congressionally mandated through the 1996 Magnuson-Stevens Fishery Conservation and Management Act.

**National Undersea Research Program**

- The AQUARIUS undersea laboratory will be the focus in FY 2000 since it will be featured with NASA's space station in the JASON XI expedition, " Life in Extreme Environments." This experience will be shared with hundreds of thousands of students and teachers. In anticipation of this two-week live event in over 20,000 posters depicting AQUARIUS and the exploration of inner space will have been distributed.

**Office of Global Programs**

- Foster greater involvement with National Science Teachers Association (NSTA)
- Take active part in "Passport-to-Knowledge" -- a live, interactive broadcast is planned for March and April 2000. "Live form the Storm" will include live transmission from on-board the NOAA vessel *Kalimimoana*. (Joint OAR & NWS funding with production and technical support from OGP.)

Concur with FY 2000 OAR Operating Plan:

Louisa Koch /signed 2-15-00

David L. Evans Date
Assistant Administrator, OAR

Scott Gudes Signed 2/22/00

Scott B. Gudes Date
Deputy Under Secretary for
Oceans & Atmosphere